

THE LOGIC OF ~~THEORY EVALUATION~~ THEORY EVALUATION

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by

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ABSTRACT

Schaffner's logic of comparative theory evaluation is criticised for an inappropriate analysis of ad hocness. An alternative analysis, based on Zahar's account of novelty, is given and extended to the case of multiple successful predictions by a theory. The application of the method to ~~the application of~~ quantitative predictions is discussed.

## The Logic of Theory Evaluation \*

### 1. The Bayesian Analysis of Ad Hocness.

In a recent note Schaffner ([1974]) has given a formal discussion of the notion of ad hocness in terms of a Bayesian model for the appraisal of theories. Schaffner develops his general ideas in the context of a critique of Zahar's [1973] which was concerned with the particular problem of comparing the Einstein and Lorentz research programmes. Zahar suggests the following analysis of ad hocness<sup>1</sup>:

Ad hoc<sub>1</sub>: A theory is said to be ad hoc<sub>1</sub> if it has no novel consequences as compared with its predecessor.

Ad hoc<sub>2</sub>: [A theory]... is ad hoc<sub>2</sub> if none of its novel predictions have been actually 'verified'.

Ad hoc<sub>3</sub>: [A]... theory is said to be ad hoc<sub>3</sub> if it is obtained from its predecessor through a modification of the auxiliary hypotheses which does not accord with the spirit of the heuristic of the programme.

Zahar explains the meaning of novelty as follows<sup>2</sup>

A fact will be considered novel with respect to a given hypothesis if it did not belong to the problem-situation which governed the construction of the hypothesis.

Schaffner begins his elucidation by discussing the notions of ad hoc<sub>1</sub> and ad hoc<sub>3</sub>. The first he describes as a logical dream, since the novel consequences of a theory cannot in practice be "surveyed", so the question of whether a theory is ad hoc<sub>1</sub> can only be discussed relative to the extent to which novel consequences have been looked for at the particular epoch of the evaluation. Ad hoc<sub>3</sub> Schaffner claims to be "vague to the point of inapplicability". For Schaffner ad hoc<sub>2</sub> is "close to

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